Design & Evaluation of Game-Based Health Interventions:

A Case Study in Physiotherapy

E.P. Braad, J. Folkerts and N. Jonker

Hanze University of Applied Sciences Groningen

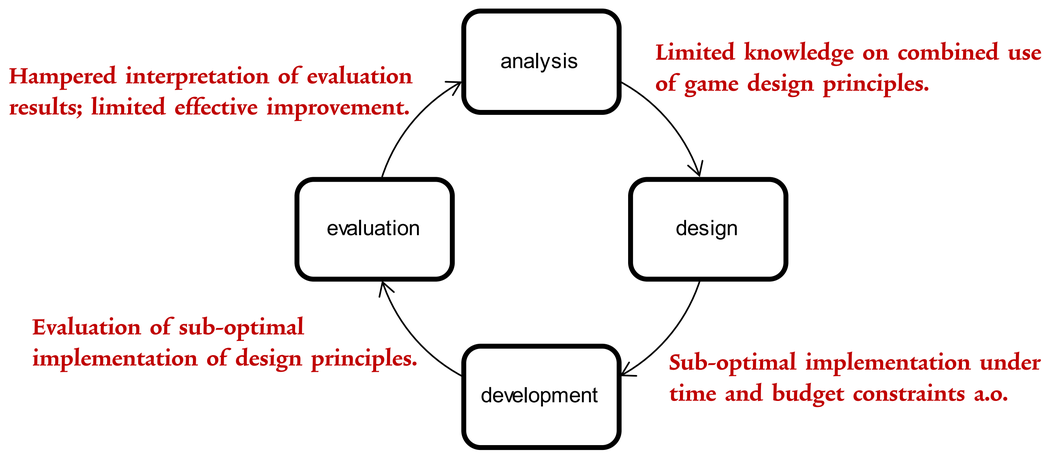
School of Communication, Media & IT

1 Introduction

- The use of games as interventions in the domain of health care is often paired with evaluating the effects in randomized clinical trials.
- Interpreting evaluation results and formulating improvements is complicated by various factors.
- This case study explores monitoring design decisions throughout the design cycle, allowing evaluation results to be attributed to design decisions.

2 Problem Analysis

- The usual process of designing, developing and evaluating game-based health interventions can be characterized using an iterative design cycle.
- Limited unification of game design principles, combined with less-than-perfect realisation in an end product limits the interpretation of evaluation results and effectiveness of subsequent improvements.



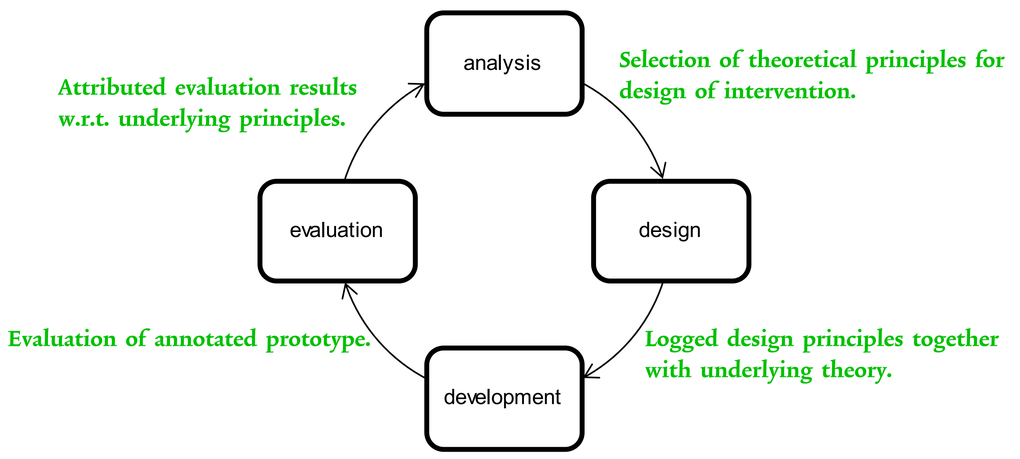
3 Case Study

- Experimental setup of motivating physiotherapy clients to perform balancing exercises at home through the use of a game with custom 'wobble board' hardware and iPad-accelerometer data.
- Internal validation through expert-review by panel of physiotherapists (n=3).
- External validation through small-scale playtest with actual clients (n=4).

Selection of images of wobble board hardware, prototype and final versions of the game.

4 Results & Conclusions

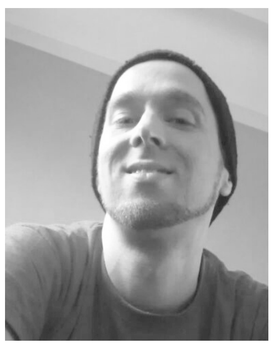
- Adopted an approach of annotated design decisions linked with the governing theoretical principles to improve efficiency of iterating the design cycle.
- Evaluation results could be attributed to corresponding design decisions and underlying theory to improve efficient development in incremental iterations of the design cycle.



Game Design & Development at Hanze University of Applied Sciences

- This research project was conducted at the School of Communication, Media & IT at Hanze University of Applied Sciences, Groningen, in close cooperation with ComPlay and Smith Fysiotherapie, Hardegarijp.
- In parallel with the research program, the School of Communication, Media & IT offers a 4-year international bachelor program in Game Design & Development. This major focuses on the design, development and evaluation of both applied games and entertainment games.
- In addition to the major program, a 30EC international minor Game On! is offered to visiting students. The minor focuses on using game design and psychology to develop a behavior-changing intervention in a virtual collaboration environment.

Eelco Braad, MSc, University Lecturer Game Design & Development



Eelco Braad is a game design and game development expert and the driving force behind the Game Design & Development major at Hanze University of Applied Sciences, Groningen. While pursuing and obtaining a Master of Science Degree in Computational Science & Scientific Visualization, he has co-founded a game studio startup. From 2010 onward he has built the education programme and research environment for game studies at Hanze University, focusing on applied games in the domain of health care and associated evaluation and validation methodologies.

Contact: e.p.braad@pl.hanze.nl